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09/868137

June 15, 2001

BOX PCT
Commissioner for Patents
Washington, D.C. 20231

PCT/FR99/03126
-filed December 14, 1999

Re: Application of Patrice LEONE
A VALVE OR PUMP GASKET
Assignee: VALOIS S.A.
Our Ref: Q64868

Dear Sir:

The following documents and fees are submitted herewith in connection with the above application for the purpose of entering the National stage under 35 U.S.C. § 371 and in accordance with Chapter II of the Patent Cooperation Treaty:

☑ an English translation of the International Application.

☑ an English translation of Article 34 amendments.

☑ a Preliminary Amendment

The Declaration and Power of Attorney, Assignment, will be submitted at a later date.

It is assumed that copies of the International Application, the International Search Report, the International Preliminary Examination Report, and any Articles 19 and 34 amendments as required by § 371(c) will be supplied directly by the International Bureau, but if further copies are needed, the undersigned can easily provide them upon request.

The Government filing fee is calculated as follows:

Total claims	10	-	20	=		x	$18.00	= $.00
Independent claims	1	-	3	=		x	$80.00	= $.00
Base Fee								$860.00
TOTAL FEE								$860.00

A check for the statutory filing fee of $860.00 is attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16, 1.17 and 1.492 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Priority is claimed from December 18, 1998 based on French Application No. 98/16040.

Respectfully submitted,

Robert J. Seas, Jr.
Registration No. 21,092

RJS/amt

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Patrice LEONE

Appln. No.: PCT/FR99/03126 Group Art Unit: Not Yet Assigned

Confirmation No.: Not Yet Assigned Examiner: Not Yet Assigned

Filed: June 15, 2001

For: A VALVE OR PUMP GASKET

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D.C. 20231

Sir:

Prior to examination, please amend the above-identified application as follows:

IN THE CLAIMS:

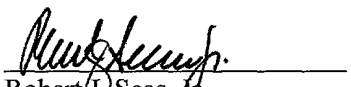
Please enter the following amended claim:

10/ A device according claim 1, in which said gasket further comprises one or more other ingredient(s) such as inorganic fillers and/or carbon black filler and/or processing agents and/or plasticizers.

REMARKS

Entry and consideration of this Amendment is respectfully requested.

Respectfully submitted,



Robert J. Seas, Jr.
Registration No. 21,092

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RJS/amt
Date: June 15, 2001

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

The claim are amended as follows:

10/ A device according ~~to any preceding~~ claim 1, in which said gasket further comprises one or more other ingredient(s) such as inorganic fillers and/or carbon black filler and/or processing agents and/or plasticizers.

A VALVE OR PUMP GASKET

The present invention relates to a valve or pump gasket for sealing a fluid dispenser device comprising a valve or a pump mounted on a fluid container.

More particularly, the gaskets of the invention are suitable for being used both in dispenser devices for dispensing pressurized fluid and including valves, and in particular metering valves, and also in dispenser devices for dispensing non-pressurized fluid and including pumps.

The gaskets used in pressurized fluid dispensers, such as aerosol devices must satisfy certain conditions and requirements. Thus, such gaskets must offer good mechanical properties, and good resistance to moisture, and must not swell too much when in contact with the propellants. In particular, such characteristics are especially important for dynamic gaskets that provide sealing between the moving valve member of the valve and the valve chamber that contains the metered quantity to be expelled.

For various reasons, and in particular for ecological reasons, chlorofluorocarbon (CFC) type propellants have largely been replaced by hydrofluorocarbon (HFC) propellants of the HFC-134a or HFC-227 types, with or without alcohol. The use of such propellants, in particular when they are used with about 20% by weight of ethanol being added, increases the stresses on the gaskets, so that the conventional materials that were used in association with CFC gases no longer present optimum characteristics.

In addition, the gaskets used in non-pressurized fluid dispenser devices, and in particular pumps, must also satisfy certain conditions and requirements. Thus, such gaskets must offer good resistance to solutions, in particular to water and ethanol solutions, i.e. solutions containing water, ethanol, or a mixture of water and of ethanol. Furthermore, such gaskets must offer good resistance to moisture and good resistance to

preservative agents, such as quaternary ammonium compounds.

An object of the present invention is to provide valve or pump gaskets that satisfy the above-mentioned requirements.

An object of the present invention is to provide a valve gasket that is designed to come into contact with a fluid and with a propellant of the hydrofluoroalkane (HFA) type, with or without alcohol, and that guarantees good mechanical properties and/or low swelling and/or good resistance to moisture.

Another object of the present invention is to provide a pump gasket that offers good resistance to water/ethanol solutions and/or good resistance to moisture, and/or good resistance to preservative agents, such as quaternary ammonium compounds.

Yet another object of the present invention is to provide a valve or pump gasket that is simple and inexpensive to manufacture.

The present invention thus provides a valve or pump gasket for sealing a fluid dispenser device comprising a valve or a pump mounted on a fluid container, said gasket being characterized in that it comprises one or more of the following elastomer materials:

a) a hydrogenated nitrile butadiene rubber (HNBR);

b) an octene-ethylene copolymer (OEC); and

c) a butyl or a halobutyl rubber.

Advantageously, said gasket further comprises one or more other ingredient(s) such as inorganic fillers and/or carbon black fillers and/or vulcanization agents and/or pigments and/or processing agents and/or plasticizers.

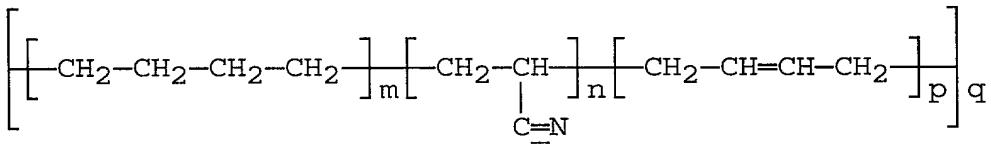
The present invention further provides a pressurized fluid dispenser device comprising a valve provided with a moving valve member, said valve being mounted on a container containing both the fluid and also a propellant, with or without alcohol, the device having at least one neck gasket between the valve and the

container, and a dynamic gasket through which said valve member slides, at least one of said gaskets being made according to the present invention.

Preferably, the propellant comprises a hydrofluorocarbon (HFC) gas of the HFC-134a type or of the HFC-227 type.

The present invention further provides a non-pressurized fluid dispenser device comprising a pump mounted on a container containing the fluid and at least one gasket between the pump and the container, said gasket or at least one of said gaskets being made according to the invention.

In a first variant, the gasket comprises as a base polymer essentially a hydrogenated nitrile butadiene rubber (HNBR). This hydrogenated nitrile elastomer generally has the following chemical formula:



This product is commercially available, and is, in particular, sold by Bayer or by Nippon Zeon.

Hitherto, this elastomer has never been used as a valve or pump gasket.

It has been observed that, as a valve gasket, when it is in contact with a fluid of the HFC-134a or HFC-227 types, with or without alcohol (e.g. ethanol), it presents excellent mechanical properties, so that it is particularly suitable for being used as a dynamic gasket. Naturally, it can also be used as a neck gasket in such an aerosol device for providing sealing between the valve and the container containing the fluid and the propellant.

In second variant, the gasket may be made in the form of an alloy comprising HNBR and octene-ethylene

copolymer (OEC). Adding polyoctene guarantees, in particular, that the gasket does not swell too much when in contact with propellants of the HFC type, with or without alcohol.

Particularly favorable results have been obtained, in particular, with a gasket material comprising about 20% by weight of HNBR and about 80% by weight of OEC. In this composition, the gasket is particularly inexpensive and easy to manufacture.

In a third variant embodiment, the elastomer component of the gasket may be an alloy of HNBR and of butyl (or halobutyl) rubber. Adding butyl or halobutyl rubber procures gaskets that offer good resistance to moisture and that do not swell too much in HFC-type propellants, with or without alcohol. Advantageous results have been obtained, in particular, with a gasket material comprising about 60% by weight of HNBR and about 40% by weight of butyl or of halobutyl rubber.

In a fourth variant, the elastomer component of the gasket may be an alloy of HNBR and of ethylene propylene (EP), or an alloy of HNBR and of ethylene-propylene-diene-monomer (EPDM). This type of alloy makes it possible to obtain gaskets that swell little, in particular with propellants of the HFC type, with or without alcohol, while also maintaining good mechanical properties. Favorable results have been obtained at reasonable manufacturing costs in particular with gaskets comprising about 50% by weight or more of HNBR and about 50% by weight or less of EP or of EPDM.

In other variants, the elastomer component may also be an alloy of HNBR and of poly-chloroprene rubber (CR) or an alloy of HNBR and of styrene butadiene rubber (SBR). These two types of alloy make it possible to obtain gaskets that have good mechanical properties and that do not swell too much in propellants of the HFC type, with or without alcohol.

HNBR is an elastomer component that is very advantageous in that it procures good mechanical properties. However, it is possible to consider making gaskets in which the elastomer component is octene-ethylene copolymer (OEC). In particular when its elastomer component comprises octene-ethylene copolymer alone, this type of gasket offers good mechanical properties and does not swell too much when in contact with propellants of the HFC type, with or without alcohol.

Furthermore, it is also possible to consider making gaskets in which the elastomer component comprises butyl or halobutyl rubber. In particular when its elastomer component comprises butyl or halobutyl rubber alone, this type of gasket offers good resistance to moisture and does not swell too much in propellants of the HFC type, with or without alcohol.

All of the above-described gasket materials may further comprise one or more other ingredients that are generally well-known in the field of gaskets. In particular, the gasket formulations may further comprise inorganic fillers or carbon black fillers, vulcanization agents, pigments, processing agents, or plasticizers.

The valve gaskets of the invention for aerosol devices may therefore be used in a large number of applications, their formulations depending mainly on the particular mechanical and sealing requirements as well as on the fluids and the propellants to be put in contact with said gaskets.

Another feature of the invention is that the gaskets of the present invention are also applicable to non-pressurized fluid dispensers including pumps mounted on containers. In which case, the gasket(s) providing the sealing between the pump and the container may be made of one of the above-described materials, thereby making it possible to obtain good resistance to water/ethanol solutions, good resistance to moisture as well as good

resistance to preservatives in particular to quaternary ammonium compounds. These properties are particularly advantageous in gasket formulations including HNBR, either alone or in an alloy.

Ease of manufacture and low cost are also advantageous features of the gaskets of the present invention.

Although particular composition ratios have been described above with reference to various gasket formulation variants, the present invention is not limited to these ratios, and the scope of the patent is defined by the accompanying claims.

CLAIMS

1/ A pressurized fluid dispenser device comprising a valve provided with a moving valve member, said valve being mounted on a container containing both the fluid and also a propellant, with or without alcohol, the device having at least one neck gasket between the valve and the container, and a dynamic gasket through which said valve member slides, said dispenser device being characterized in that the propellant comprises a hydrofluorocarbon (HFC) gas of the HFC-134a type or of the HFC-227 type, and in that at least one of said gaskets comprises one or more of the following elastomer materials:

a) a hydrogenated nitrile butadiene rubber (HNBR); and

b) a butyl or a halobutyl rubber.

2/ A device according to claim 1, in which said gasket comprises an alloy of HNBR and of octene-ethylene copolymer (OEC).

3/ A device according to claim 2, in which the gasket comprises about 20% by weight of HNBR and about 80% by weight of OEC.

4/ A device according to claim 1, in which said gasket comprises an alloy of HNBR and of butyl or of halobutyl rubber.

5/ A device according to claim 4, in which said gasket comprises about 60% by weight of HNBR and about 40% by weight of butyl or of halobutyl rubber.

6/ A device according to claim 1, in which said gasket comprises an alloy of HNBR and of ethylene propylene (EP) or of ethylene-propylene-diene-monomer (EPDM).

7/ A device according to claim 6, in which said gasket comprises about 50% by weight or more of HNBR and a about 50% by weight or less of EP or of EPDM.

8/ A device according to claim 1, in which said gasket comprises an alloy of HNBR and of poly-chloroprene rubber (CR).

9/ A device according to claim 1, in which said gasket comprises an alloy of HNBR and of styrene butadiene rubber (SBR).

10/ A device according to any preceding claim, in which said gasket further comprises one or more other ingredient(s) such as inorganic fillers and/or carbon black fillers and/or vulcanization agents and/or pigments and/or processing agents and/or plasticizers.

This translation of an amended page covers the amendments made in the original. However, the page breaks match the translation, so that this page is also a replacement page that fits in with the remainder of the translation.

A B S T R A C T

A VALVE OR PUMP GASKET

A valve or pump gasket for sealing a fluid dispenser device comprising a valve or a pump mounted on a fluid container, said gasket being characterized in that it comprises one or more of the following elastomer materials:

a) a hydrogenated nitrile butadiene rubber (HNBR);
b) an octene-ethylene copolymer (OEC); and
c) a butyl or a halobutyl rubber.

Declaration and Power of Attorney for Patent Application

Déclaration et Pouvoirs pour Demande de Brevet

French Language Declaration

En tant que l'inventeur nommé ci-après, je déclare par le présent acte que:

As a below named inventor, I hereby declare that:

Mon domicile, mon adresse postale et ma nationalité sont ceux figurant ci-dessous à côté de mon nom.

My residence, post office address and citizenship are as stated next to my name.

Je crois être le premier inventeur original et unique (si un seul nom est mentionné ci-dessous), ou l'un des premiers co-inventeurs originaux (si plusieurs noms sont mentionnés ci-dessous) de l'objet revendiqué, pour lequel une demande de brevet a été déposée concernant l'invention intitulée

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

A VALVE OR PUMP GASKET

et dont la description est fournie ci-joint à moins que la case suivante n'ait été cochée:

☐ a été déposée le _____
sous le numéro de demande des Etats-Unis ou le numéro de demande international PCT
_____ et modifiée le
_____ (le cas échéant).

the specification of which is attached hereto unless the following box is checked:

___ was filed on December 14, 1999
as United States Application Number or PCT International Application Number
FR/99/03126 and was amended on
December 15, 2000 (if applicable).

Je déclare par le présent acte avoir passé en revue et compris le contenu de la description ci-dessus, revendications comprises, telles que modifiées par toute modification dont il aura été fait référence ci-dessus.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

Je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations.

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56.

French Language Declaration

Je revendique par le présent acte avoir la priorité étrangère, en vertu du Titre 35, § 119(a)-(d) ou § 365(b) du Code des Etats-Unis, sur toute demande étrangère de brevet ou certificat d'inventeur ou, en vertu du Titre 35, § 365(a) du même Code, sur toute demande internationale PCT désignant au moins un pays autre que les Etats-Unis et figurant ci-dessous et, en cochant la case, j'ai aussi indiqué ci-dessous toute demande étrangère de brevet, tout certificat d'inventeur ou toute demande internationale PCT ayant une date de dépôt précédant celle de la demande à propos de laquelle une priorité est revendiquée.

I hereby claim foreign priority under Title 35, United States Code, § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below, and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Prior foreign application(s) Demande(s) de brevet antérieure(s)		Priority Not Claimed Droit de priorité non revendiqué
98.16040 (Number) (Numéro)	FRANCE (Country) (Pays)	18/12/1998 (Day/Month/Year Filed) (Jour/Mois/Année de dépôt) —
(Number) (Numéro)	(Country) (Pays)	(Day/Month/Year Filed) (Jour/Mois/Année de dépôt) —

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 119(e) du Code des Etats-Unis, de toute demande de brevet provisoire effectuée aux Etats-Unis et figurant ci-dessous.

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)
(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)

Je revendique par le présent acte tout bénéfice, en vertu du Titre 35, § 120 du Code des Etats-Unis, de toute demande de brevet effectuée aux Etats-Unis, ou en vertu du Titre 35, § 365(c) du même Code, de toute demande internationale PCT désignant les Etats-Unis et figurant ci-dessous et, dans la mesure où l'objet de chacune des revendications de cette demande de brevet n'est pas divulgué dans la demande antérieure américaine ou internationale PCT, en vertu des dispositions du premier paragraphe du Titre 35, § 112 du Code des Etats-Unis, je reconnais devoir divulguer toute information pertinente à la brevetabilité, comme défini dans le Titre 37, § 1.56 du Code fédéral des réglementations, dont j'ai pu disposer entre la date de dépôt de la demande antérieure et la date de dépôt de la demande nationale ou internationale PCT de la présente demande:

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)	(Status)(patented, pending, abandoned) (Statut)(breveté, en cours d'examen, abandonné)
(Application No.) (N° de demande)	(Filing Date) (Date de dépôt)	(Status)(patented, pending, abandoned) (Statut)(breveté, en cours d'examen, abandonné)

Je déclare par le présent acte que toute déclaration ci-incluse est, à ma connaissance, véridique et que toute déclaration formulée à partir de renseignements ou de suppositions est tenue pour véridique; et de plus, que toutes ces déclarations ont été formulées en sachant que toute fausse déclaration volontaire ou son équivalent est passible d'une amende ou d'une incarcération, ou des deux, en vertu de la Section 1001 du Titre 18 du Code des Etats-Unis, et que de telles déclarations volontairement fausses risquent de compromettre la validité de la demande de brevet ou du brevet délivré à partir de celle-ci.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

French Language Declaration

POUVOIRS: En tant que l'inventeur cité, je désigne par la présente l'(les) avocat(s) et/ou agent(s) suivant(s) pour qu'ils poursuive(nt) la procédure de cette demande de brevet et traite(nt) toute affaire s'y rapportant avec l'Office des brevets et des marques: *(mentionner le nom et le numéro d'enregistrement).*

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: *(list name and registration number)*

30

John H. Mion, Reg. No. 18,879; Donald E. Zinn, Reg. No. ~~19,046~~; Thomas J. Macpeak, Reg. No. 19,292; Robert J. Seas, Jr., Reg. No. 21,092; Darryl Mexic, Reg. No. 23,063; Robert V. Sloan, Reg. No. 22,775; Peter D. Olexy, Reg. No. 24,513; J. Frank Osha, Reg. No. 24,625; Waddell A. Biggart, Reg. No. 24,861; Robert G. McMorrow, Reg. No. 19,093; Louis Gubinsky, Reg. No. 24,835; Neil B. Siegel, Reg. No. 25,200; David J. Cushing, Reg. No. 28,703; John R. Inge, Reg. No. 26,916; Joseph J. Ruch, Jr., Reg. No. 26,577; Sheldon I. Landsman, Reg. No. 25,430; Richard C. Turner, Reg. No. 29,710; Howard L. Bernstein, Reg. No. 25,665; Alan J. Kasper, Reg. No. 25,426; Kenneth J. Burchfiel, Reg. No. 31,333; Gordon Kit, Reg. No. 30,764; Susan J. Mack, Reg. No. 30,951; Frank L. Bernstein, Reg. No. 31,484; Mark Boland, Reg. No. 32,197; William H. Mandir, Reg. No. 32,156; Scott M. Daniels, Reg. No. 32,562; Brian W. Hannon, Reg. No. 32,778; Abraham J. Rosner, Reg. No. 33,276; Bruce E. Kramer, Reg. No. 33,725; Paul F. Neils, Reg. No. 33,102; and Brett S. Sylvester, Reg. No. 32,765.

Adresser toute correspondance à:

Send Correspondence to:
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2100 Pennsylvania Avenue, N.W., Suite 800
Washington, D.C. 20037-3202

Adresser tout appel téléphonique à:
(nom et numéro de téléphone)

Direct Telephone Calls to:
(name and telephone number)

Nom complet de l'unique ou premier inventeur Patrice LEONE	Full name of sole or first inventor
Signature de l'inventeur — Date 25/06/2001	Inventor's signature — Date
Domicile 6, rue des Bergeronnettes 27400 ACQUIGNY / FRANCE	Residence
Nationalité FRANCAISE	Citizenship
Adresse postale Same as domicile	Post Office Address
Nom complet du second co-inventeur, le cas échéant	Full name of second joint inventor, if any
Signature du second inventeur — Date	Second inventor's signature — Date
Domicile	Residence
Nationalité	Citizenship
Adresse postale	Post Office Address

(Fournir les mêmes renseignements et la signature de tout co-inventeur supplémentaire.)

(Supply similar information and signature for third and subsequent joint inventors.)